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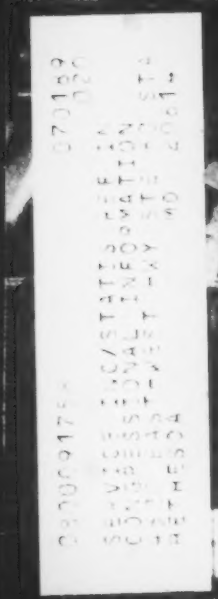

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Smooth start raises OSB production goal

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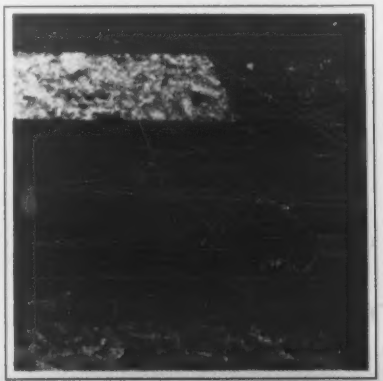

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The margins weren't as great last year, but new production, consumption records were set nonetheless in structural panel, particleboard and MDF categories. Export markets were strong

Strong panel markets shatter records again

San Francisco, California

Again last year, production records fell in most elements of the wood-based panel industry in the United States. The margins were smaller than a year before, but a record is a record—especially for a year in which the crucial housing market continued to soften.

Structural panels, particleboard and medium-density fiberboard registered higher figures. Hardboard shipments again declined in volume. Figures for the decade are shown in the table at the bottom of this page. In summary:

- Structural panels (softwood plywood, oriented strand board, waferboard and oriented waferboard) as a group accounted for production of 27.2 billion ft² (⅜-in. basis), exceeding the 1987 mark by less than 1%.
- Particleboard shipments, estimated at 3.8 billion ft², were up 3.3% from 1987.
- MDF shipments for 1988 were estimated at 942.6 million ft², an increase of 4.8% over the year before.
- Hardboard shipments last year dropped 6.2% to 5.1 billion ft².

Growth trends for all panel products were interrupted by the recession of 1980-82, although by 1983 structural panel and MDF segments had eclipsed pre-slump production figures to set new records, broken annually ever since.

While particleboard shipments have been climbing steadily since a low point in 1982, it was not until last year that the annual volume set an all-time record.

Looking at the decade, comparison of 1988 and 1978 figures reveals MDF gained 85.4%, structural panels improved by 36.3% and particleboard netted a 2.9% increase, while hardboard declined by 34.4%.

Canadian panel output, with the exception of waferboard, declined marginally in 1988 (see sidebar, opposite page).

Structural panels

While 1988 was the sixth consecutive record year for structural panel production, it was the first in which softwood plywood alone failed to register a gain.

Plywood represented 83% of the production total, approximately 22.6 billion ft² versus 23.3 billion ft² the year before. Non-veneer panels comprised the balance of some 4.6 billion ft², up from just under 4 billion ft².

The overall gain was realized in spite of plywood production lost due to strikes in the West during 1988, and declines in both housing and nonresidential construction markets. On the plus side were increases in demand from remodeling (up 6%), industrial (up 3% and export (up 25%) sectors.

Structural panel exports broke the 1 billion ft² mark in 1988 for the first time, according to the American Plywood Assn. At 1.004 billion ft², exports exceeded the 1987 record by 208 million ft².

This performance was credited by Tom Fast, APA director of international operations, to favorable exchange rates, strengthening economies worldwide, continuing progress in reducing tariff and other import barriers, and strong international promotion by APA and the USDA Foreign Agricultural Service.

Approximately 78% of U.S. structural panel exports last year went to Europe, with the United Kingdom taking the greatest volume. Strong percentage gains were recorded elsewhere in Europe, plus the Caribbean, Mexico and Japan.

U.S. Panel Production, 1978-1988

(thousand ft²)

Year	Structural panels (⅜-in. basis)	Particleboard[1] (¾-in. basis)	Hardboard[1] (¼-in. basis)	MDF[1] (¾-in. basis)
1978	19,964,000	3,720,369	7,800,000	508,416
1979	19,653,000	3,376,488	7,687,798	506,728
1980	16,468,000	2,949,897	6,140,000	493,140
1981	17,023,000	2,869,352	6,104,000	516,102
1982	16,402,554	2,393,066	5,586,918	446,157
1983	20,821,342	3,009,343	7,302,702	604,323
1984	21,967,917	3,195,586	6,837,118	633,974
1985	22,838,170	3,330,517	6,300,146	684,593
1986	25,632,830	3,602,757	5,822,328	780,598
1987	27,001,000	3,705,560	5,457,508	899,282
1988	27,202,822	3,828,745[2]	5,117,857	942,579[2]

[1] Shipments; [2] Estimated.

Despite growth in exports and other non-housing markets, the expected further softening of housing demand is expected to hold back structural panel production this year. APA currently projects 1989 production at 26.5 billion ft². By 2010, however, the association is looking for output of 27.2 billion ft².

Particleboard and MDF

Particleboard output, measured by shipments, put 1988 in the record books with an estimated total of 3.8 billion ft² (¾-in. basis). The previous record, set in 1978, was 3.7 billion ft² (see table for exact figures).

The U.S. particleboard industry has grown rapidly, both in terms of consumption and plant capacity. The latest annual capacity survey by National Particleboard Assn. places U.S. mat-formed particleboard mat capacity at 4.311 billion ft² as of Jan. 1, 1989. Capacity should grow to 4.379 billion ft² by the end of 1979, according to NPA.

The success of MDF in the marketplace continues to be demonstrated by growth in consumption and plant capacity. Shipments stumbled only slightly during the early-eighties recession before recovering in 1983, the first year in which the 600 million ft² level was exceeded. Annual increases have continued since then.

Last year's estimated shipment volume of 942.6 million ft² compares with U.S. plant capacity of 1.202 billion ft² at the beginning of 1989, according to the NPA survey. Capacity should rise to 1.252 billion ft² by the end of the year.

To step up promotion of particleboard and MDF applications, the NPA has established the Particleboard/MDF Institute as a separate and independent organization.

NPA members are automatically regular members of the institute, beyond which contributing memberships are open in five categories. Membership is open to suppliers of equipment, chemicals, coatings and laminates.

"The institute will work aggressively to expand the customer base as well as to increase the use per unit of particleboard and MDF," it was explained.

Hardboard

Hardboard production in 1989 should just about equal the 1988 level of 5.1 billion ft² (⅛-in. basis), according to C. Curtis Peterson, executive vice president of American Hardboard Assn.

Peterson, formerly staff vice president, succeeded James E. Nolan, who retired at the end of 1988 after 20 years as AHA's chief staff executive. ■

B.C. gain counters national plywood decline

VANCOUVER, B.C.—With the exception of waferboard, production of wood-based panels across Canada declined slightly in 1988, as compared with the year before. Levels remained ahead of 1986, however.

Statistics Canada reported softwood plywood output last year at 2 [illegible]58 m³, a 3% slide from the 1987 volume of 2,229,000 m³. In 1986, a lengthy strike in British Columbia pushed nationwide softwood plywood production down to 1,876,896 m³.

Particleboard production last year came to 1,213,364 m³, a level 10.5% below the 1987 figure of 1,355,107 m³. Production in 1986 was 1,139,253 m³.

Waferboard output, however, rose last year to 1,658,560 m³, a gain of 3.2% over the 1987 level of 1,607,171 m³. The 1966 figure was 1,347,638 m³.

British Columbia went opposite the national trend in softwood plywood production. Council of Forest Industries of B.C. member mills turned in a production figure for the year of 1.621 billion ft² (⅜-in. basis), 4.7% above 1987 production of 1.548 billion ft².

Peter Metcalfe, COFI's manager of market development, credited the increase to (1) continued strength in domestic markets, particularly the exceptionally-strong construction sector in Ontario; (2) continued expansion of the specialty panel market domestically and overseas; and (3) increased productivity and efficiency of member mills through significant capital investments in new equipment.

While the strong housing market in Canada is expected to waver in 1989 due to increasing interest rates, Metcalfe expects the plywood industry to operate at near-capacity levels.

In Canada, the priority is to regain market share in housing lost to composite panels. The introduction of COFI-ROOF, a plywood roof sheathing with a patented edge profile, is expected to help accelerate this process. A technical specialist will be retained to expand the industrial use of plywood in eastern Canadian markets.

Exports of B.C. plywood in 1988 increased 6% to over 260 million ft² from 245.2 million ft² in 1987. Overseas observations:

- Timber frame construction should continue to expand as a preferred system for residential building in the United Kingdom, Metcalfe said. COFI members are major suppliers to this market.
- Builders in West Germany are recognizing the benefits of wood frame housing and are adapting it to their own particular building requirements. COFI Exterior plywood is the only North American plywood which has DIN acceptance.
- In 1988, Japan granted COFI approval as a Foreign Testing Organization, allowing members to apply the Japan Agricultural Standards stamp to their plywood production. Thus costly reinspection in Japan is not required.
- COFI is building a demonstration project in Beijing, China, to promote wood frame construction. Three buildings will utilize B.C. lumber and plywood in systems commonly used elsewhere: trusses, web-joists, stressed skin panels and other standard lumber and plywood applications. ■

***Wood frame construction** is the focal point of a demonstration project in Beijing, which the Council of Forest Industries of B.C. is undertaking.*

A major study conducted recently shows limited growth by the year 2000 for high-density and medium-density overlays; waferboard siding is a notable exception

Industrial overlay markets: forecasts for HDO and MDO

Oradell, New Jersey

Industrial medium and high-density overlays are used on plywood and waferboard for a variety of purposes: to produce smooth, paintable surfaces; to make smooth surfaces for concrete forms; to provide a durable impenetrable surface skin for signs and sidings; and to hide the pattern of reconstituted wood with a paintable simulated wood grain.

Medium-density overlays (MDO) and high-density overlays (HDO) are used in a range of markets, such as concrete forms; exterior and interior signs; truck doors and sides; residential siding, store fixtures; millwork; and miscellaneous residential construction applications. Recently George Carter & Affiliates (GC&A), a consulting firm based here, completed a major four-month investigation of the markets in the U.S. for MDO and HDO.

The report traces the use of the two types of overlays from 1979, when about 255 million ft² (surface measure basis) of overlaid panels were produced, to the year 2000, when it is forecast that nearly 950 million ft² will be consumed.

One of the important aspects of the research is the analysis of which segments will participate in this growth, which are holding steady, and which, if any, are losing ground.

GC&A found total consumption of panels with industrial overlays (nondecorative) in the U.S. in 1988 amounted to 548 million ft², of which HDO accounted for 97.6 million ft², MDO accounted for 445.9 million ft², and imports accounted for 4.5 million ft². For a further breakdown, see Table 1.

Table 1—U.S. industrial overlay consumption, 1988

High-density panel products consist of:	
• Concrete forms	27.5 MMSF
• Industrial uses	17.9 MMSF
• Door skins	42.2 MMSF
• Other uses	10.0 MMSF
Medium-density overlaid panel products consist of:	
• Concrete forms	67.1 MMSF
• Industrial uses	125.0 MMSF
• Plywood siding	25.8 MMSF
• Waferboard and particleboard siding	220.0 MMSF
• Other uses	8.0 MMSF

According to the report, overlaid panel consumption in the U.S. has increased about 113% since 1979, from 257 million ft² to more than 548 million ft². During that period, HDO has increased 27% and MDO, excluding waferboard siding, has increased 58%. Waferboard siding has increased from zero to 160 million ft².

The report forecasts that consumption of overlaid panels will increase 72% by the year 2000. However, at the present time, it does not appear that HDO products will share in much of this growth. The use of MDO products will increase, but most of the growth is expected to come from waferboard siding, forecast to grow 250%.

The current research, which involved more than 830 interviews, did not turn up any significant new markets which might develop for high-density panels in the next 10 to 12 years. Carter notes the following findings:

• There is evidence to suggest that consumption might be increased slightly if wider distribution was achieved. However, it is difficult to ascertain if it is worth the cost of trying to get a large number of geographically scattered, largely rural dealers and wholesalers to inventory HDO plywood, and to find customers for the product.

• Nearly 100 interviews with concrete forms manufacturers and users suggest that HDO panels have reached an equilibrium with steel. Thus, consumption will move with the basic economic indicators, and not show any further market penetration.

• The use of HDO in industrial applications is limited, and no evidence is currently visible to suggest that even moderate opportunities may exist.

In the MDO sector, the story is much the same: No significant new markets appear to be developing.

The research team notes that usage in signs is growing slightly. However, competition from aluminum is strong, and wood panels are not forecast to increase their market share. Usage in fixtures and displays is exhibiting some growth, but competition from decorative overlays and a variety of substrates makes extensive growth unlikely. In making the prediction of explosive growth for waferboard siding, Carter notes that its use will increase rapidly due to active promotion, cost competitiveness and growing market acceptance.

The siding materials most likely to be affected by overlaid waferboard are hardboard, lower grade cedar boards and plywood. Smooth and beaded hardboard, top-quality cedar, brick and vinyl will resist the impact of overlaid waferboard, Carter says. ■

THIS ARTICLE highlights only a few of the findings in the Carter study, published in three volumes. GC&A also has published studies on residential sidings and decorative overlays. For details, contact George Carter & Affiliates, 767 Park Ave., Oradell, N.J. 07649. Tel. 201-265-7766.

The decision about how to determine a site's productive potential is a major one for foresters. High production is not the only consideration

Determining optimum yield from forest plantations

A GIVEN AREA of land can only produce a certain quantity of wood.

These days, a great deal of emphasis is put on maximizing the production of wood on all lands. The volume produced largely depends on the foresters who, much of the time, underestimate the potential of their lands.

It is, of course, essential not to let the aspect of maximum quantity of production totally dominate management decisions. Other criteria may be of equal or even greater importance. Certainly a high volume of production is critical in fuelwood plantations and carries much weight in successful pulpwood plantation programs. But especially where the end use is in the form of solid-wood products, properties such as strength or appearance may be more important.

Normally, quality and quantity are not mutually exclusive. A skilled silviculturist should be able to make use of management systems which simultaneously guarantee a high volume of production and acceptable wood quality. Only when it comes to plantations managed for certain purposes—e.g., those established for erosion control or watershed protection—does high wood production become of minor importance.

Considerations about climate

A major factor which we cannot do much about is the climate. The climate of boreal and temperate areas, with lower temperatures and little or no growth during the winter, normally results in lower production than in the tropics. This cannot be fully compensated for by the longer summer daylight hours of the high latitudes or by often higher soil nutrient levels or less drought stress.

Production from managed forests and plantations in various parts of the world is indicated in Table 1. These figures in no way indicate maximum production. In many or perhaps even most cases, average growth rates shown in the table can be at least doubled by introducing known silvicultural treatments.

How to boost productivity

The greatest increases in productivity have been reached through a number of advanced tree improvement activities.

Consider, for instance, the plantations of Aracruz Forestal in Brazil. Through the introduction and improvement of eucalypts on low productive grass lands—where less than 10 years ago the stands produced "only" around 30 m^3 ha/yr—the plantations are now producing 70 m^3 ha/yr, and the very best clones are capable of producing over 100 m^3 ha/yr.

Another example from the temperate areas—less dramatic, certainly, but demonstrating the possibilities—is from Sweden. By replacing the indigenous Scots pine with the exotic lodgepole pine, production yield increases of 50%

Fig. 1—Comparison of top shoot length, after use of three site prep treatments

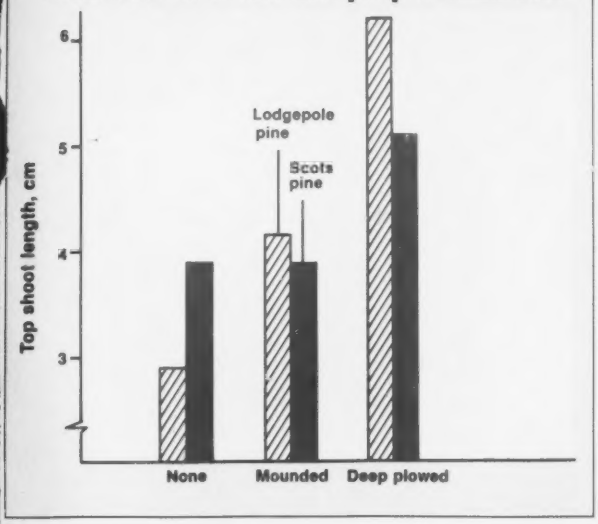

Fig. 2—Comparison of tree height in a fertilizer trial

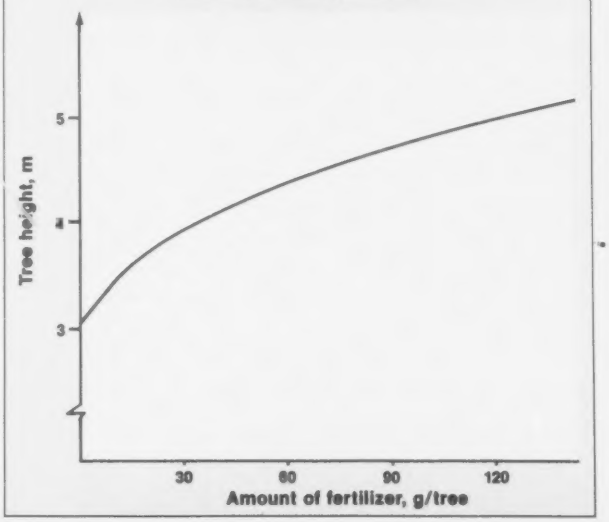

TABLE 1—Average growth rates in managed forests and plantations

Region	Yield (m^3/ha/yr)
Siberia	1 - 1.5
Scandinavia	1.5 - 5
United Kingdom (conifers)	7-12
New Zealand (pines)	15-30
Tropical pine plantations	15-45
Tropical eucalypt plantations	10-60

have been reached on suitable sites.

To fully utilize the production potential of the best regeneration material, it must be put in the most favorable environment possible and given suitable silvicultural treatments. Only then will it show its capacity and respond more vigorously than less productive material.

One example of the type of response to be expected, taken from a trial in northern Sweden on a very poor and cold site, is presented in Fig. 1.

The illustration shows top shoot length for two years after planting, where three different site preparation treatments were used. Note the superiority of the fast-growing lodgepole pine on the most intensively prepared site, and its inferiority when no site preparation was carried out.

On sites with various kinds of nutrient deficiencies, fertilization often gives good response and may in fact be a prerequisite of forest plantations. Fig. 2 demonstrates the response to fertilization of young *Eucalyptus camaldulensis* trees planted at Bai Bang, Vietnam. It illustrates tree height in a fertilizer trial one and a half years after planting. Trees were fertilized at planting with various amounts of super-phosphate.

The economy of fertilization depends on the cost of fertilizers, interest rates, rotation length and the magnitude and duration of the response. In many situations, it may be a better alternative to plant a less demanding, but then also less productive species, rather than to be forced to fertilize regularly.

Is maximum production the goal?

How, when and in what form the harvest becomes available is actually just as important as the absolute amount of wood produced, since this will decide the economy of the forest operation.

The denser the plantation, the faster the volume production potential of an area is obtained; the trees will be able to occupy the total growing space quickly.

There are, however, at least two major disadvantages to dense planting: a high stand establishment cost and the small size of the trees to be harvested. With good thinning practices, trees of an acceptable size still may be produced, but the high establishment cost remains. Further, there may not be much use for the trees harvested in the thinning, in itself a costly operation.

The foresters must decide how much volume can be sacrificed and how much time spent to optimize monetary returns from a plantation. And this is always different from maximizing the total wood production from the site. Various methods to control costs and returns are available. Say, for example, that large trees for saw timber are needed:

• One alternative would be to plant at close spacing and thin at correct times. The main advantages are a good utilization of the site's productive capacity, possible use of trees which might otherwise be killed from competition, good self-pruning and fewer problems with weeds because of early canopy closure.

The major disadvantages are high initial costs and the need for the high-cost removal of many small, low-quality trees and of the longer rotations. Much damage can also be caused to the growing stand during the thinning operation.

• Another alternative is to plant more openly, not thin and make an early final harvest of large trees. Obvious advantages are a lower planting cost and no thinning problems. Disadvantages are that parts of the land will not be utilized for parts of the rotation because of the low stocking and good opportunities for weeds to get established. Even if all trees can be harvested and utilized, they may be of poor quality (e.g., large limbs) because of lack of competition early in their life. Availability of improved genetic stock or suitable pruning makes this alternative more interesting.

The decision on how to handle a stand's or site's productive potential is a major one. A high volume production is not enough. The wood must be suitable for whatever is to be produced from it.

For many products and purposes, the weight rather than volume would be the best way to measure the production. Species with the highest productivity or silvicultural treatments which favor maximum growth may not always produce the kind of wood that is needed. ■

A first-generation **Pinus caribaea** ***stand in Vietnam; it needs improvement.***

THIS ARTICLE was prepared by Per H. Ståhl and Göran Nilsson Axberg, forestry consultants and silviculture specialists with Interforest AB. For more information from Interforest, circle the number below on the reader service card in this issue.

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